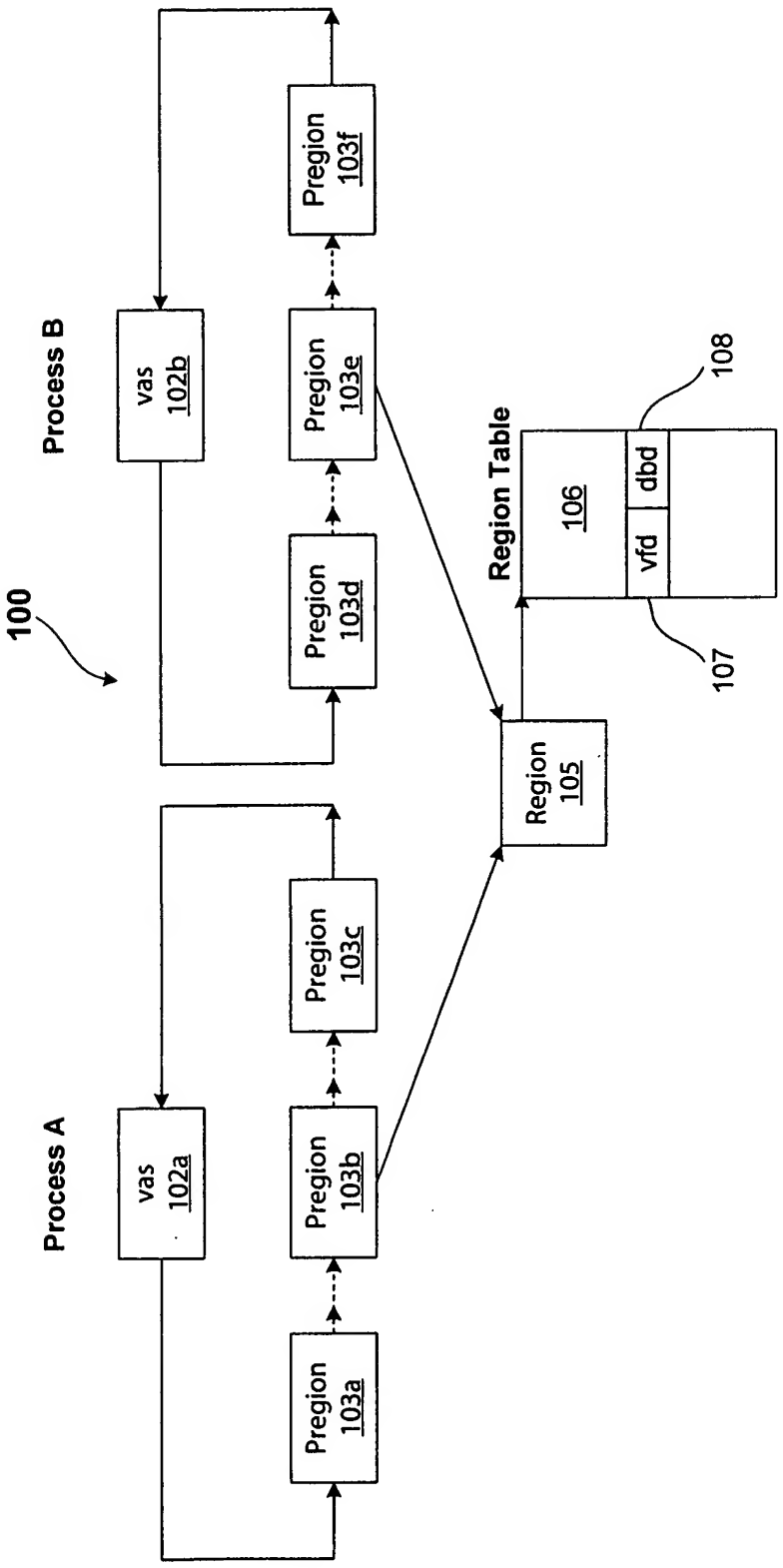


FIG. 1

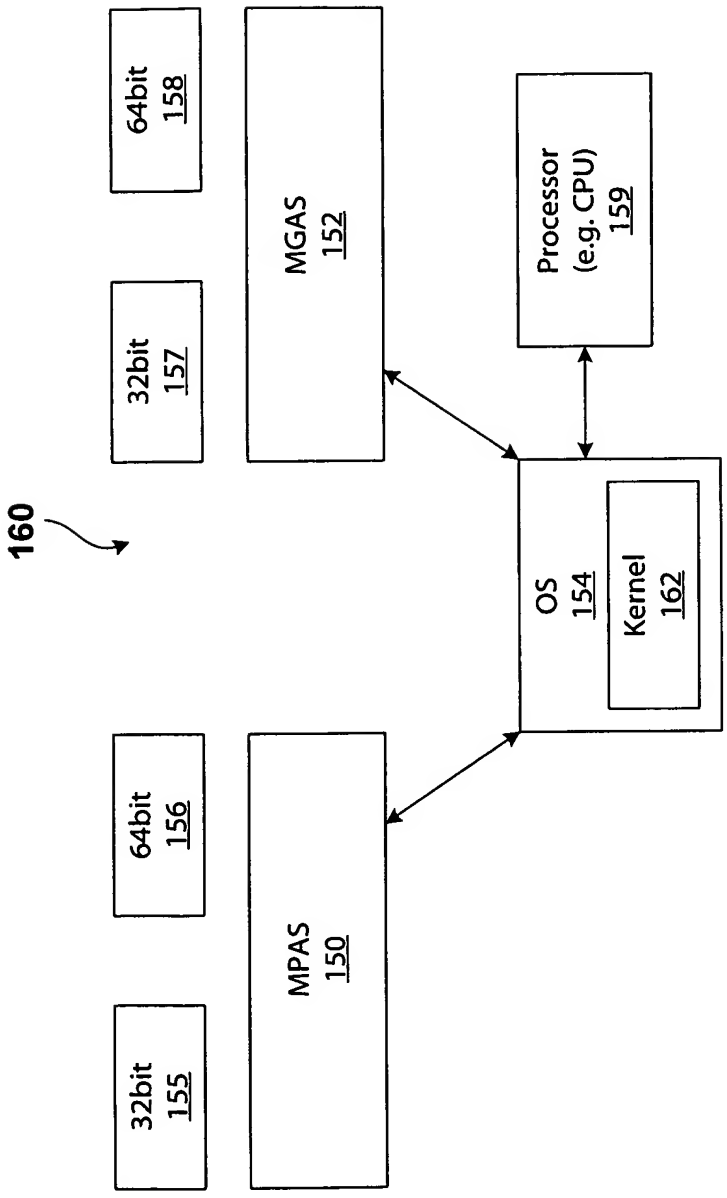

160
64bit 158
32bit 157
MGAS 152
Processor (e.g. CPU) 159
OS 154
Kernel 162
64bit 156
32bit 155
MPAS 150

FIG. 2

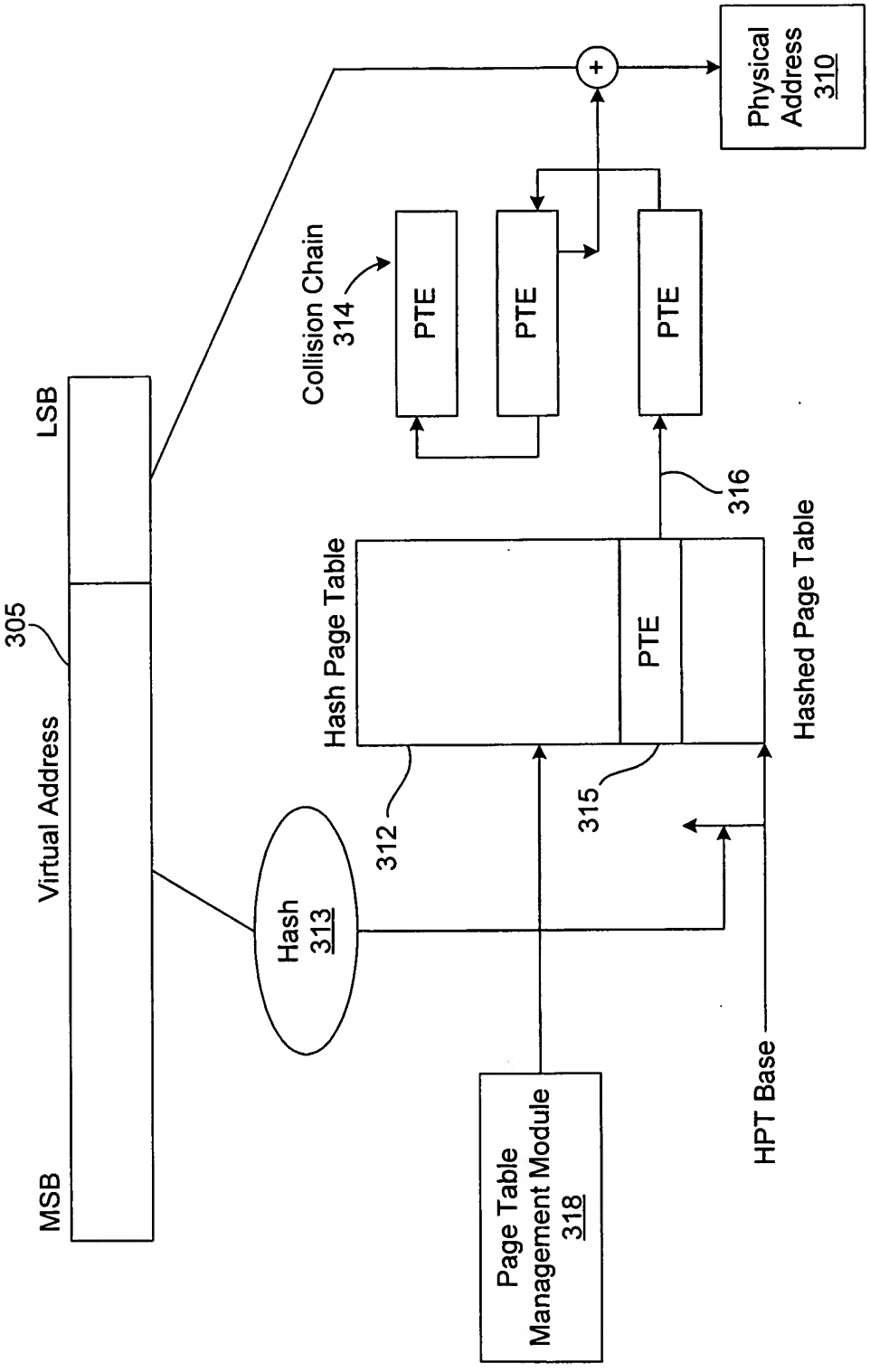
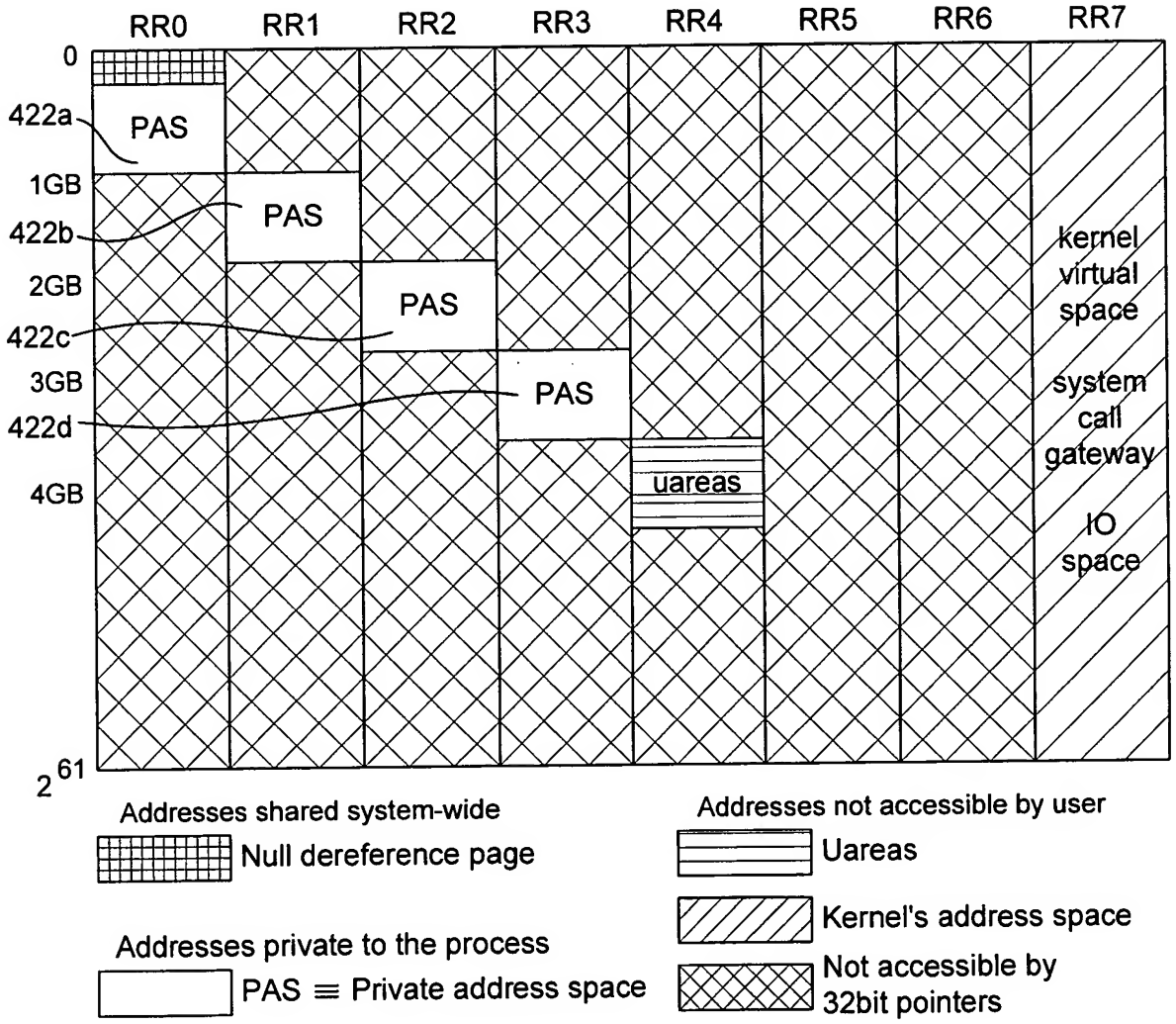

Physical Address 310
+
Collision Chain 314
PTE
PTE
PTE
316
Hash Page Table
PTE
Hashed Page Table
312
315
LSB
305
Virtual Address
MSB
Hash 313
Page Table Management Module 318
HPT Base

FIG. 3



32bit MPAS Address Space Layout (ASL) in segmented representation

FIG. 4A

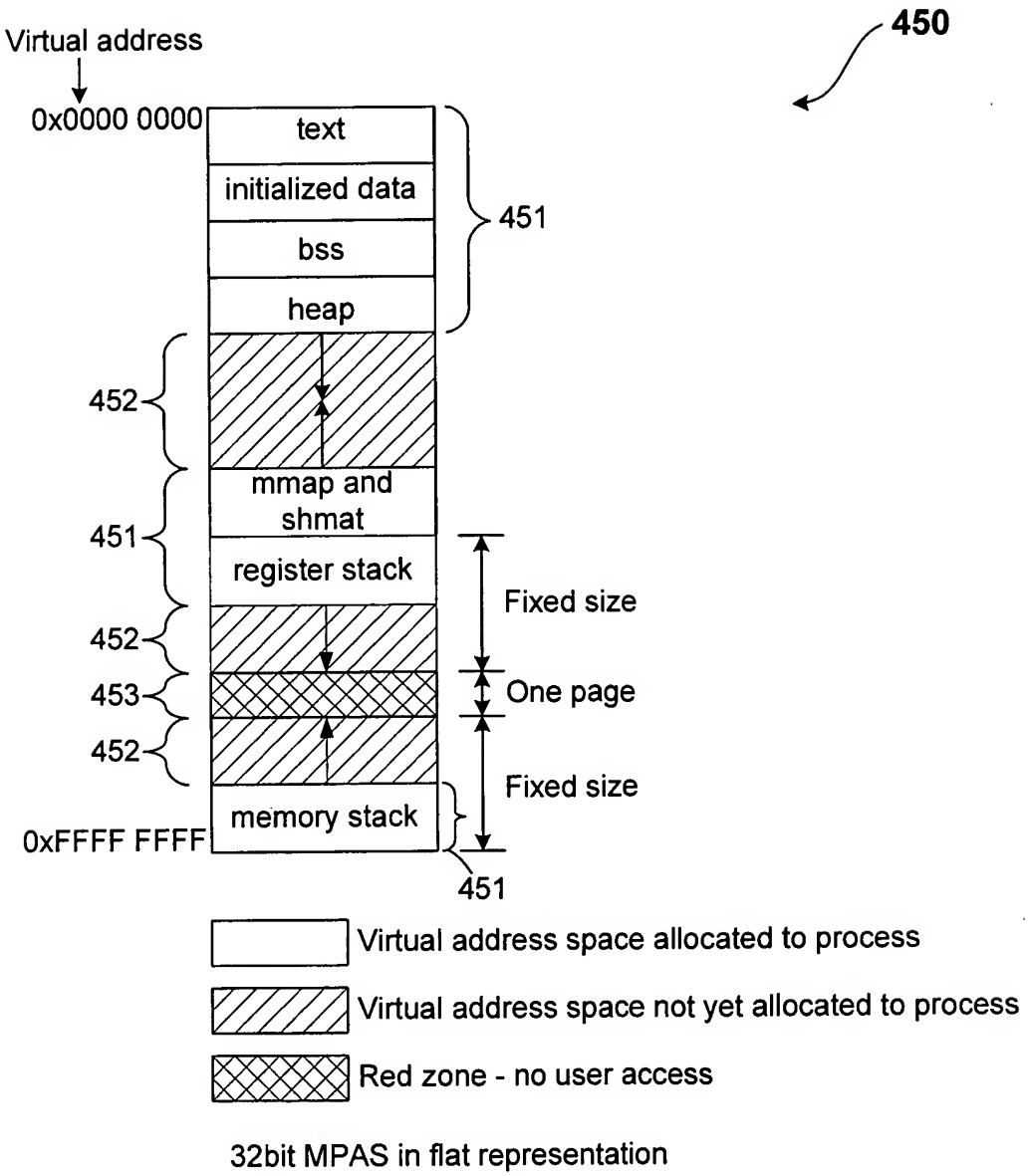
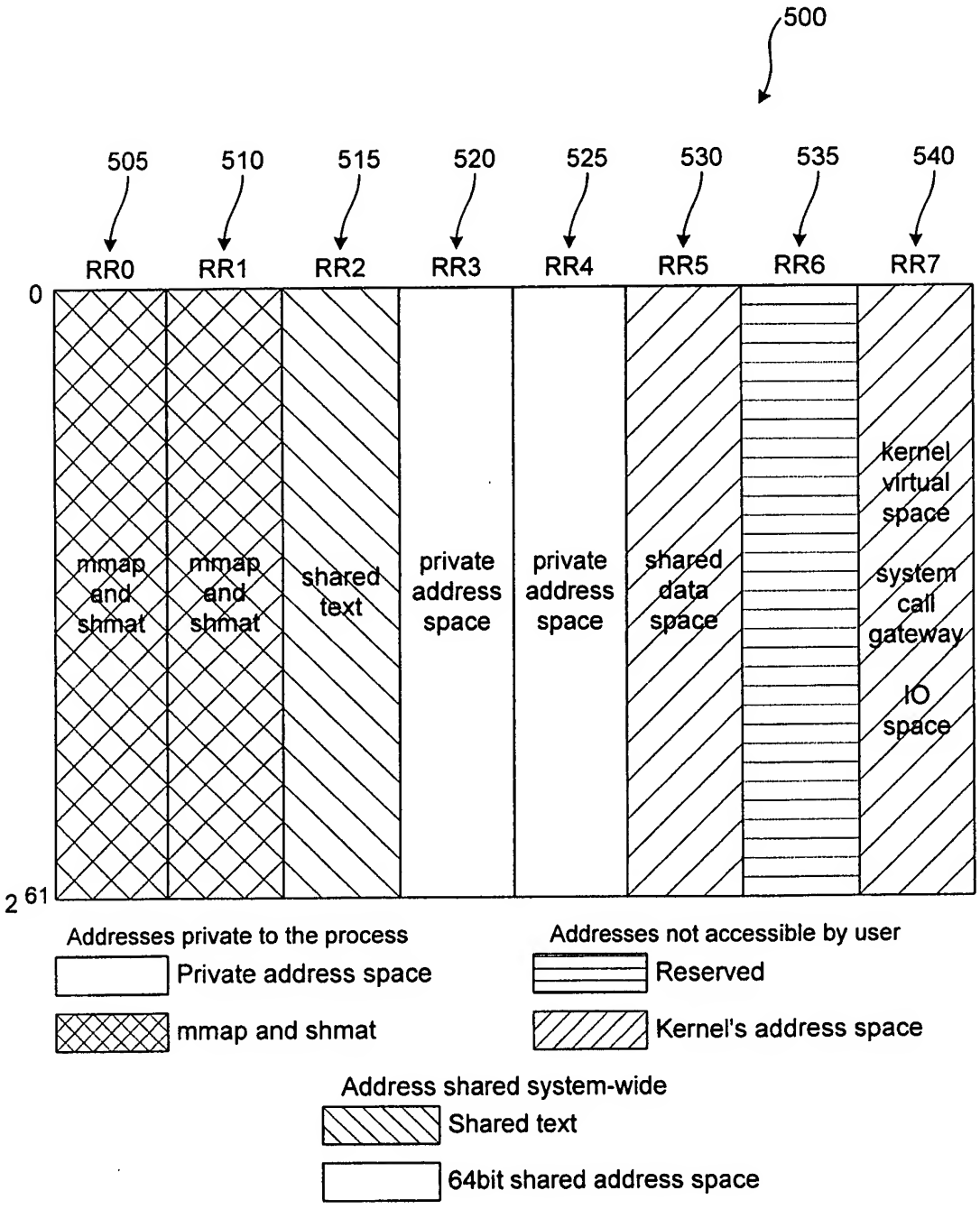
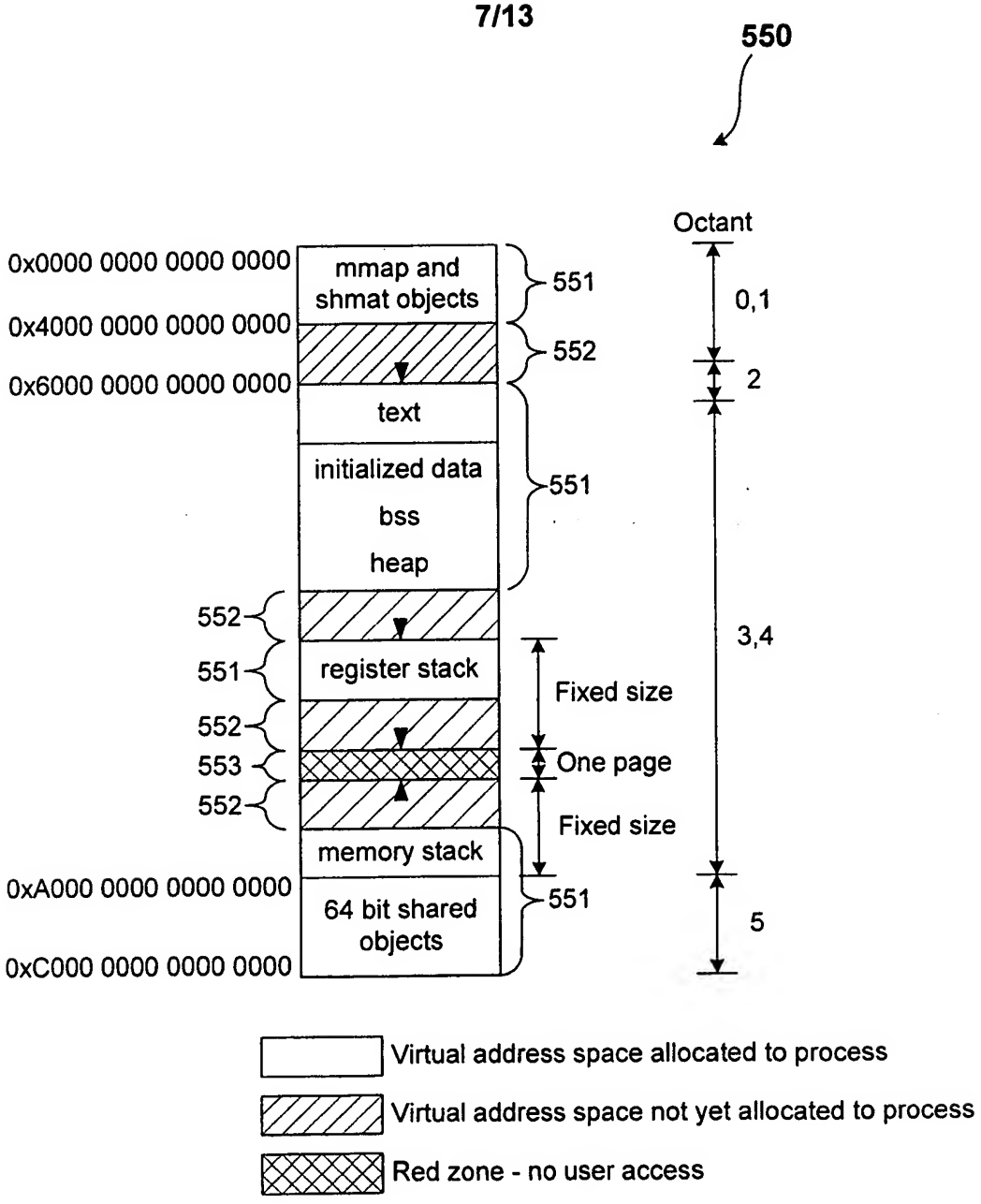

Virtual address
0x0000 0000
text
initialized data
bss
heap
451
452
mmap and
shmat
451
register stack
Fixed size
452
453
One page
452
Fixed size
memory stack
0xFFFF FFFF
451
450
Virtual address space allocated to process
Virtual address space not yet allocated to process
Red zone - no user access
32bit MPAS in flat representation

FIG. 4B



64bit MPAS (in segmented representation)

FIG. 5A



64bit MPAS in flat representation (only octants 0-5 are shown)

FIG. 5B

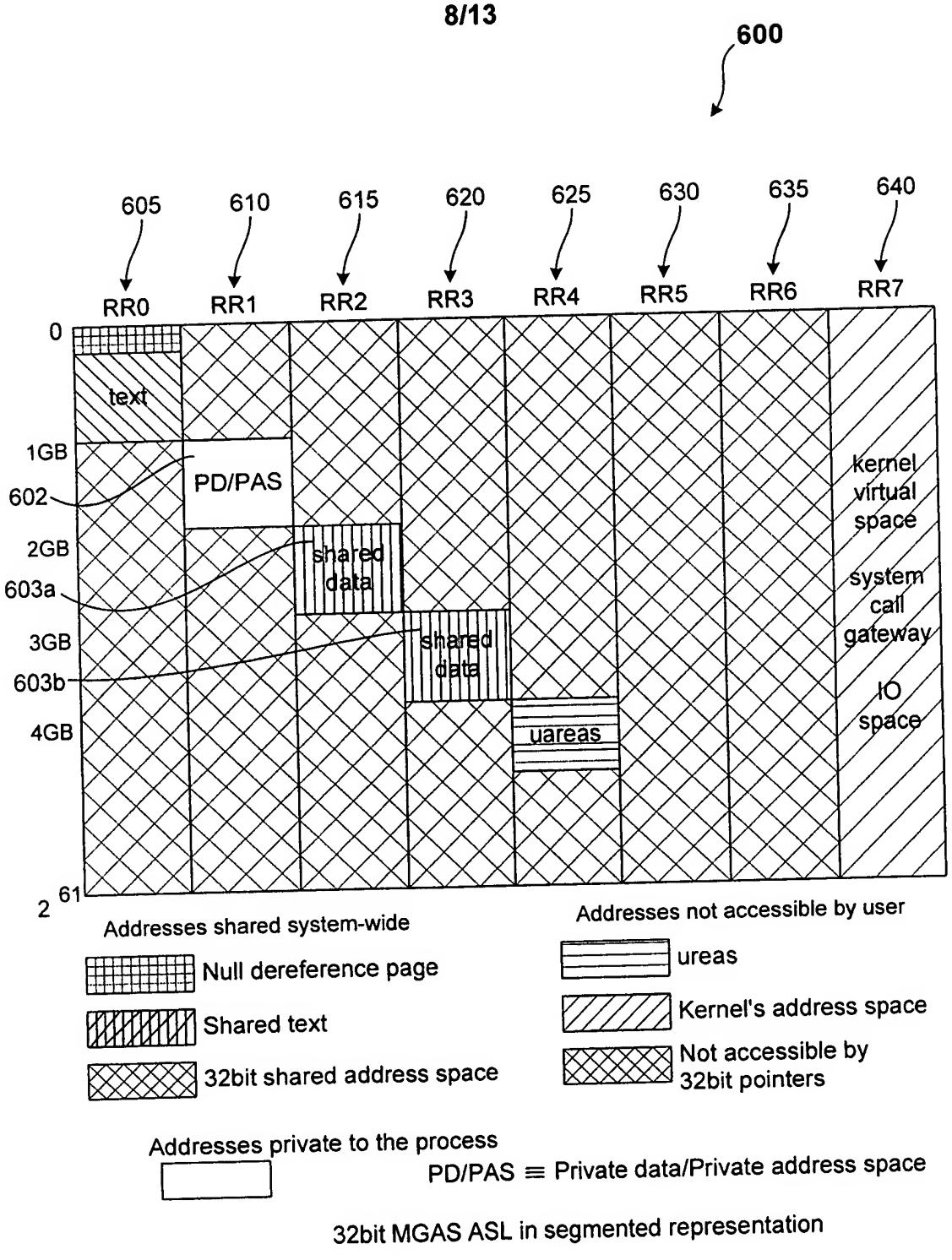

600
605
610
615
620
625
630
635
640
RR0
RR1
RR2
RR3
RR4
RR5
RR6
RR7
0
1GB
602
2GB
603a
3GB
603b
4GB
2 61
text
PD/PAS
shared data
shared data
uareas
kernel virtual space
system call gateway
IO space
Addresses shared system-wide
Null dereference page
Shared text
32bit shared address space
Addresses not accessible by user
ureas
Kernel's address space
Not accessible by 32bit pointers
Addresses private to the process
PD/PAS ≡ Private data/Private address space
32bit MGAS ASL in segmented representation

FIG. 6A

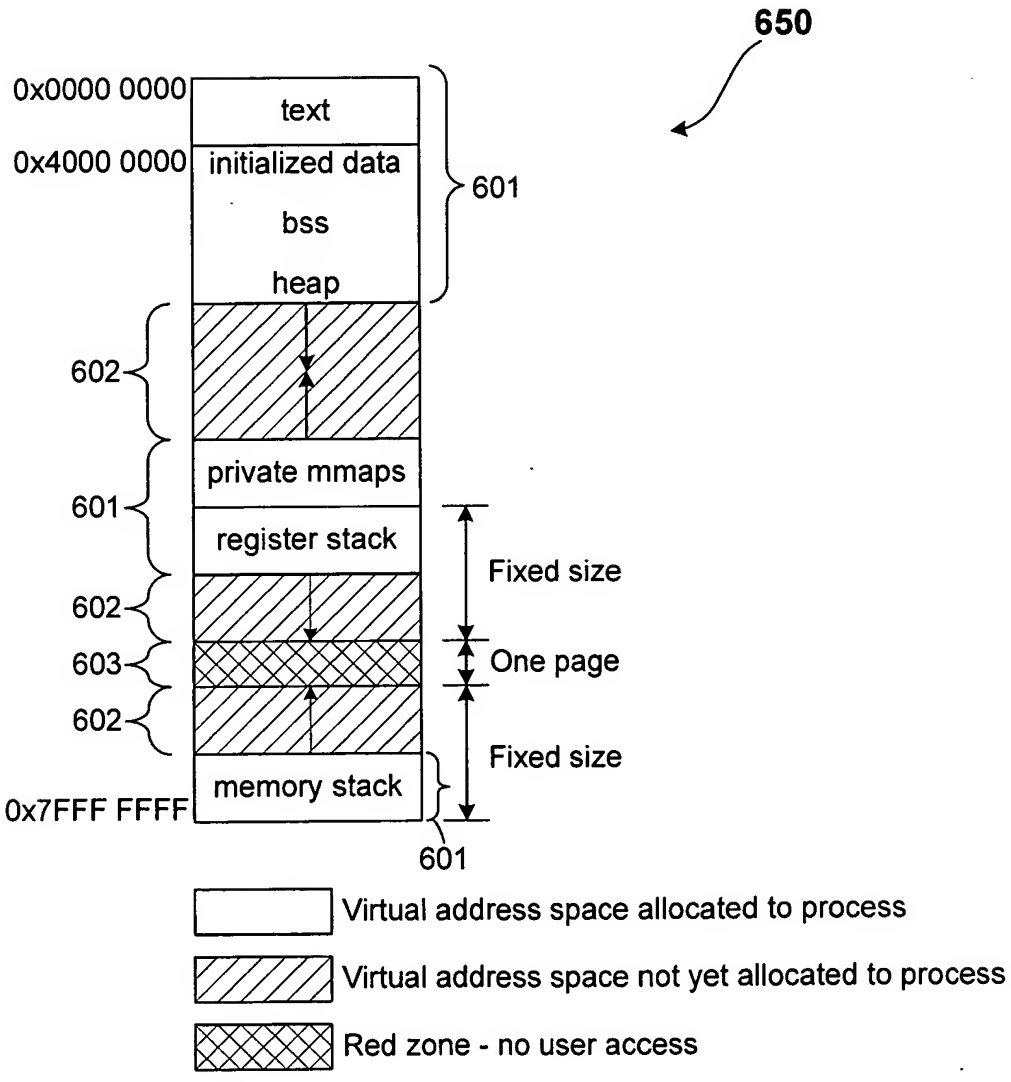

650
0x0000 0000
text
0x4000 0000
initialized data
bss
heap
601
602
private mmaps
601
register stack
Fixed size
602
603
One page
602
Fixed size
memory stack
0x7FFF FFFF
601
Virtual address space allocated to process
Virtual address space not yet allocated to process
Red zone - no user access
32bit MGAS ASL in flat representation

FIG. 6B

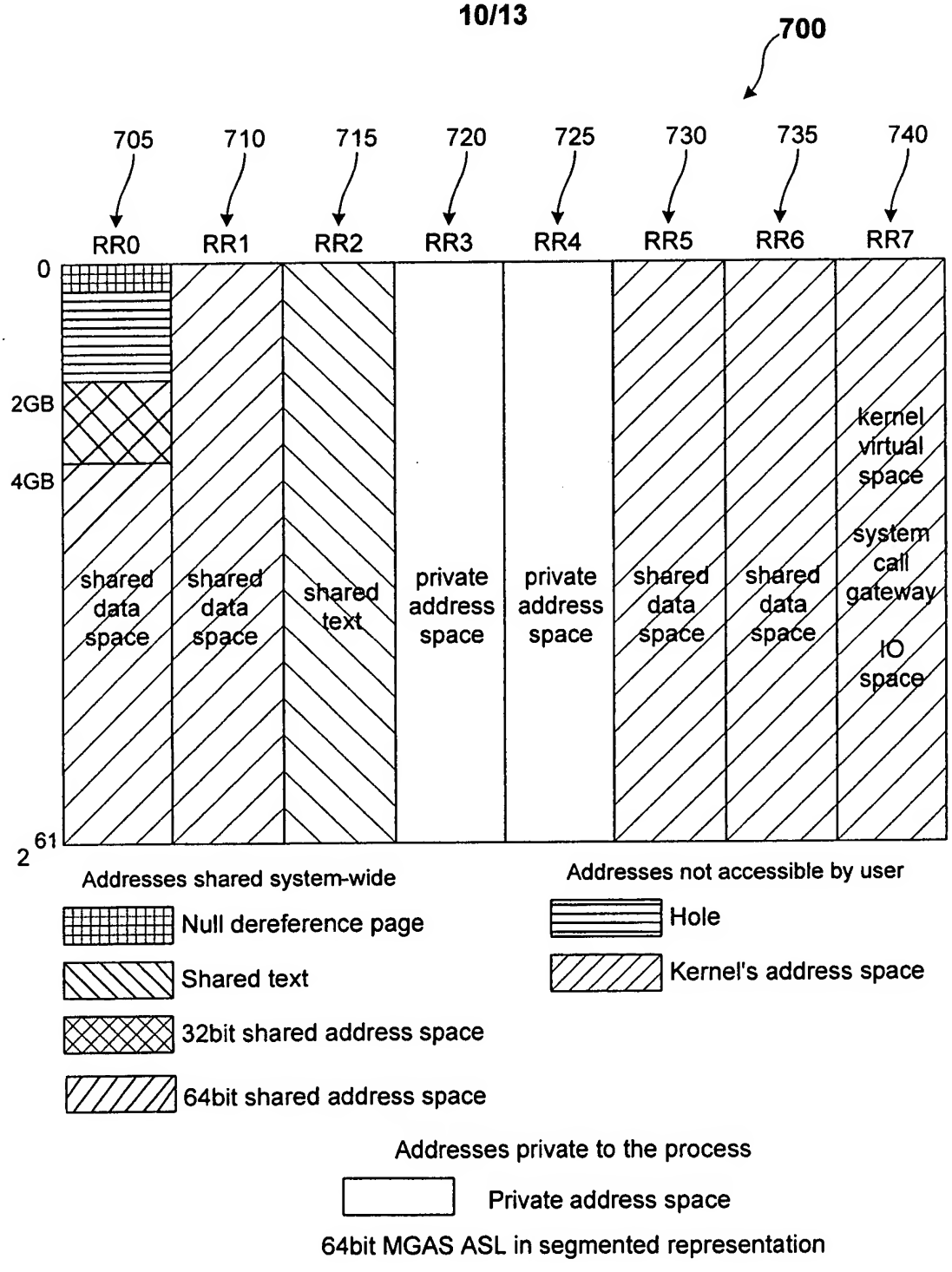
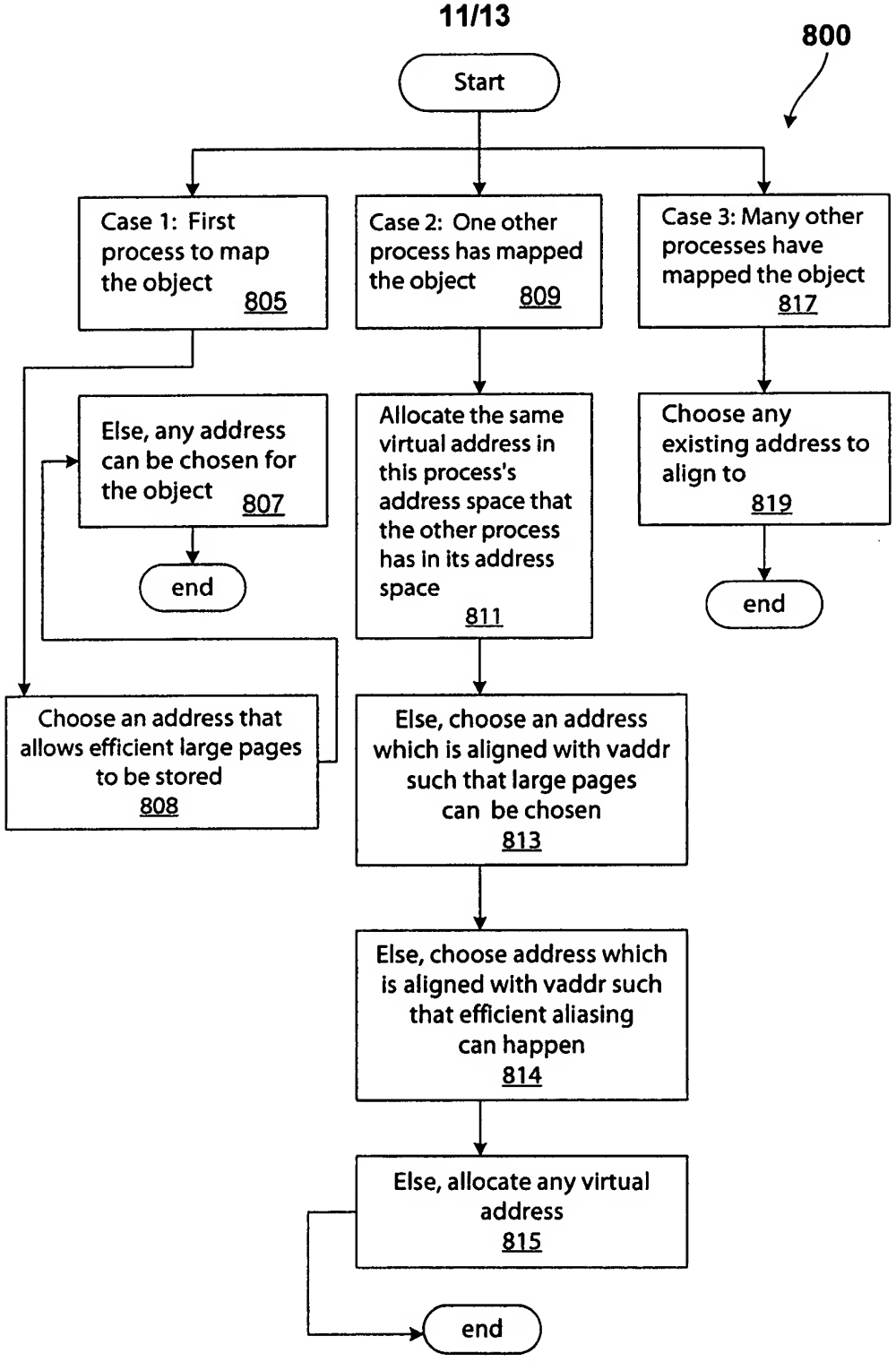

700
705
710
715
720
725
730
735
740
RR0
RR1
RR2
RR3
RR4
RR5
RR6
RR7
0
2GB
4GB
2 61
shared data space
shared data space
shared text
private address space
private address space
shared data space
shared data space
kernel virtual space
system call gateway
IO space
Addresses shared system-wide
Null dereference page
Shared text
32bit shared address space
64bit shared address space
Addresses not accessible by user
Hole
Kernel's address space
Addresses private to the process
Private address space
64bit MGAS ASL in segmented representation

FIG. 7



Allocating Address Space for 32bit MPAS Processes

FIG. 8

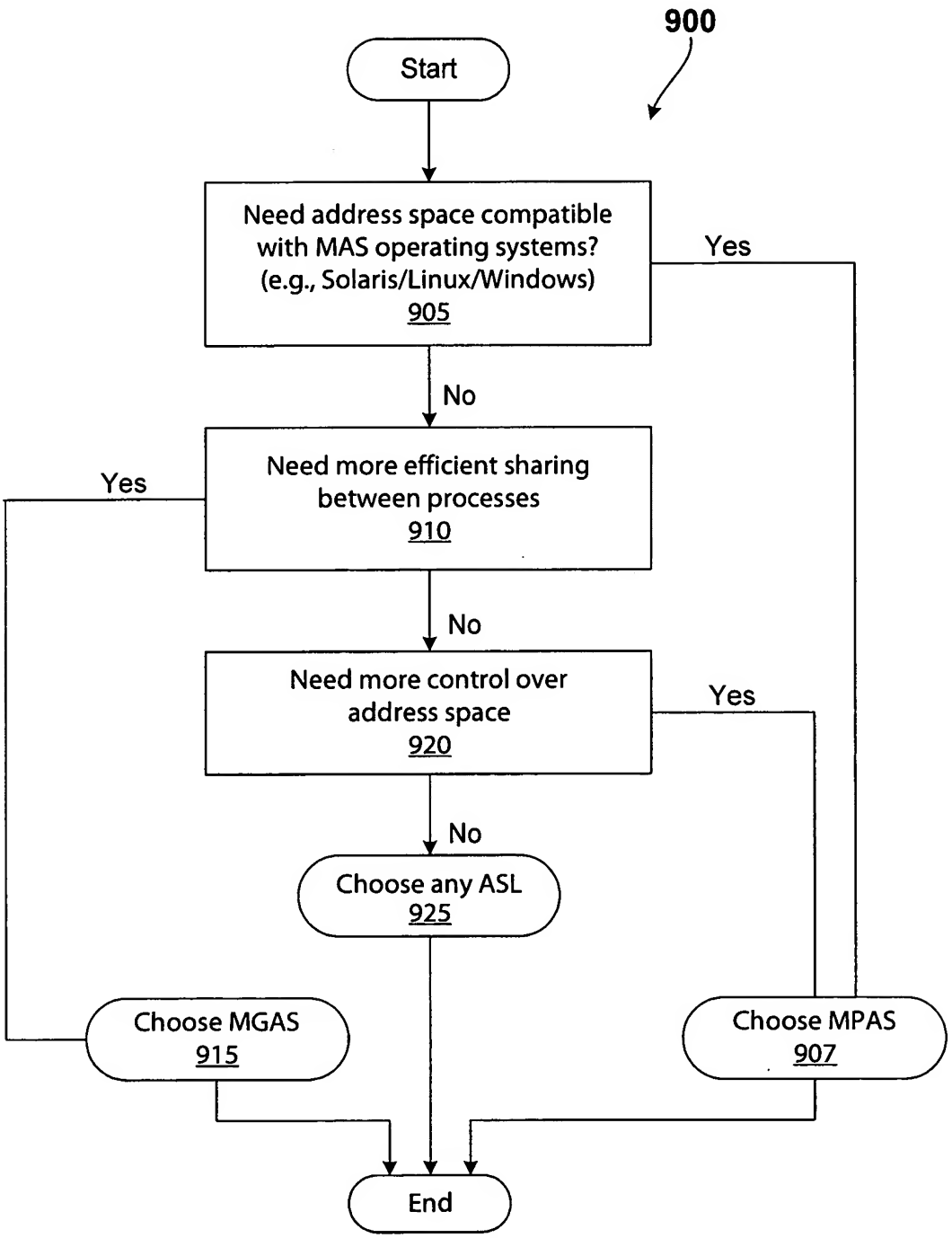

900
Start
Need address space compatible with MAS operating systems? (e.g., Solaris/Linux/Windows)
905
Yes
No
Need more efficient sharing between processes
910
Yes
No
Need more control over address space
920
Yes
No
Choose any ASL
925
Choose MGAS
915
Choose MPAS
907
End

FIG. 9

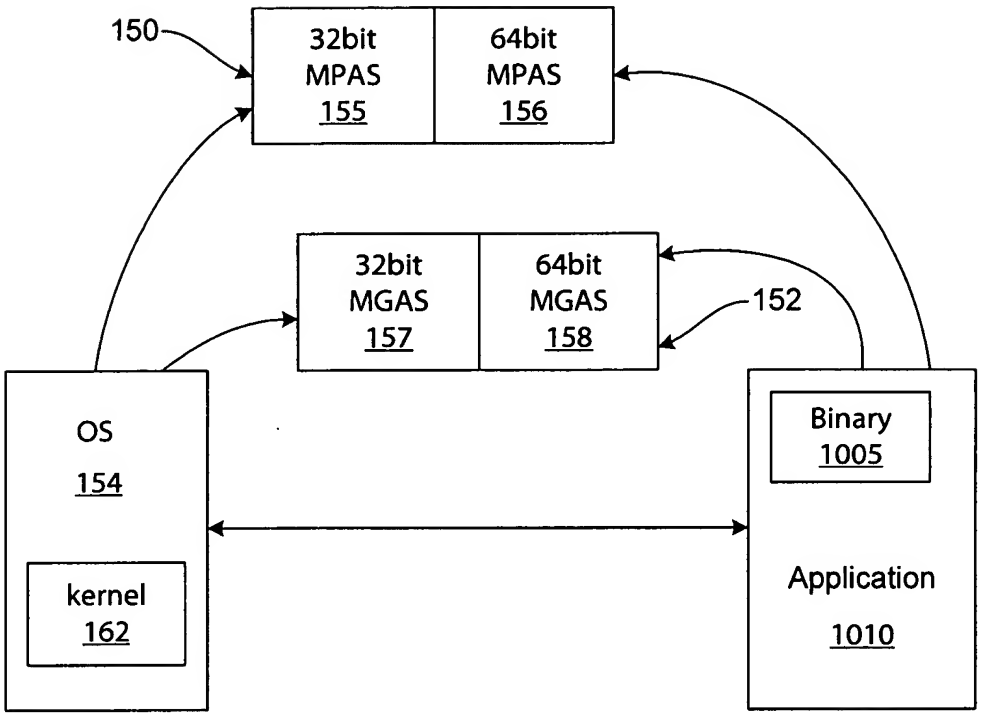

150
32bit
MPAS
155
64bit
MPAS
156
32bit
MGAS
157
64bit
MGAS
158
152
OS
154
kernel
162
Binary
1005
Application
1010

FIG. 10